3.7 Accuracy Assessment

An accuracy assessment effort was completed for FIIS in accordance with the NPS vegetation mapping specifications. Some modification was needed to address specific needs of this project. These are explained below.

3.7.1 Data Collection

The accuracy assessment phase was carried out similar to other NPS vegetation mapping projects. We used guidelines from The Nature Conservancy (1994) (Table 3.) to determine the number of accuracy assessment points needed for Fire Island. The target

Table 3. Target number of accuracy assessment points per class as presented by The Nature Conservancy (1994).

Scenario	Description	Polygons in class	Area occupied by class	Recommended number of samples in class
A	Abundant. Many polygons that cover a large area	≥ 30	≥ 50 ha	30
B	Relatively abundant. Class has few polygons that cover a large area	< 30	≥ 50 ha	20
C	Relatively rare. Class has many polygons, but covers a small area. Many polygons are close to the MMU.	> 30	< 50 ha	20
D	Rare. Class has few polygons, which may be widely distributed. Most or all polygons are close to the MMU.	≥ 5, ≤ 30	< 50 ha	5
E	Very rare. Class has too few polygons to permit sampling. Polygons are close to the MMU.	< 5	< 50 ha	Visit all and confirm

number of points was obtained by examining the number of polygons mapped at Fire Island, the area of the polygon itself, an expected 10% loss of points in the field, and the total area of each type mapped on the Island.

Because many of the discernable polygons at Fire Island were below the 0.25 ha MMU, we opted to further divide the assessment into polygons at or above the 0.25 ha MMU and to those below. An additional 10 points were added in polygons below the MMU in an attempt to assess whether the map accuracy was diminished by the presence of these smaller units. The result was a maximum of 43 points for vegetation types falling into Scenario A. This includes 30 points for polygons greater than 0.25 ha, 3 additional points to account for unattainable points in the field, and 10 points in polygons below the MMU. The list of accuracy assessment points by vegetation class is given in Table 4.

Table 4. Target number of accuracy assessment points for each map class. For vegetation codes see Table 6.

VegCode	Area (ha)	Total # Polys	# Polys > 0.25	# polys < 0.25	Total # of AA points	total small poly pts.	Overall
Forests							
6376	26.0	34	26	8	22	8	30
707	2.9	2	2	0	2	0	2
6373	0.3	1	1	0	1	0	1
6375	97.1	95	85	10	33	10	43
6156	5.2	10	7	3	7	3	10
802	76.6	171	82	89	33	10	43
6381	18.4	28	19	9	5	9	14
Woodland							
6117	15.0	53	22	31	22	10	32
Shrubland							
6295	182.2	523	244	279	33	10	43
6145	244.8	412	268	144	33	10	43
3886	3.4	12	6	6	5	6	11
6371	31.7	84	56	28	22	10	32
6063	68.7	229	92	137	33	10	43
Dwarf-Shrubland							
6143	74.5	193	100	93	33	10	43
6141	3.3	21	3	18	3	10	13
6243	38.3	31	21	10	21	10	31
Herbaceous							
6274	245.0	584	279	305	33	10	43
4097	3.9	7	5	2	5	2	7
6342	4.1	12	5	7	5	7	12
6611	0.0						0
6150	5.5	37	7	30	5	10	15
4187	136.8	324	161	163	33	10	43
4192	175.0	463	244	219	33	10	43
6006	169.9	363	238	125	33	10	43
6067	1.6	1	0	1	1	0	1
6107	19.0	25	21	4	20	4	24
Sparse Vegetation							
4400	0.0	0					
Totals	1649.4	3715	1994	1721	476	189	665

Once the target number of points per class was established, we employed the GIS to randomly select the actual accuracy assessment point location. Each individual vegetation class was selected from the map. Then a systematic grid of points spaced 60 m apart was generated for the entire area. Points that intersected the vegetation type were selected and the rest were deleted. These points were subdivided into points that intersected vegetation polygons greater than, or less than, the MMU. For the larger polygon set, all points that were less than 10 m of the delineated polygon edge were removed. The resulting points (if greater that the target number) were randomized and the target number of points was selected. The set of smaller polygon points were randomized and the target number was selected. These points were inspected and moved to the approximate center of their respective polygon to avoid confusion in the field. In either case, if not enough points met the above criterion polygons were randomly selected for visitation and points were added to their approximate geographic center to reach the target number of points.

A total of 665 accuracy assessment points were established, representing 579 polygons. These locations were divided into routes that could be gathered in a single field day (approximately 40 per day) and loaded into field GPS software. This allowed the field crews to navigate to accuracy assessment points with their GPS units.

The accuracy assessment mission was conducted in September of 2001. CMI and NPS staff that were not familiar with the vegetation map and had no previous experience at Fire Island served as assessors. The vegetation key (see Appendix 7.6) was used to classify the vegetation surrounding each assessment team. Assessors were instructed to visually establish the polygon boundary on the ground then assign a vegetation class from the key. In addition, the assessor was asked to provide a categorical confidence value to their assignment of low, medium, or high confidence. The navigator, using the GPS, recorded which class was observed and the confidence category. They also recorded the position of the point, the spatial confidence of the navigator, as well as any other notes the assessor or navigator deemed important. The completed accuracy assessment routes were loaded onto a laptop computer and differentially corrected to ensure spatial accuracy.

3.7.2 Analysis

The accuracy of the mapped classes was assessed with a traditional contingency table. We calculated the producers and consumers accuracy for each class as well as a 90% confidence interval for that estimate. We used a kappa, or k-hat, coefficient to estimate the overall map accuracy. This was performed separately on the accuracy assessment set for polygons at or above the 0.25 ha MMU as well as the set for smaller polygons.